ABSTRACT

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Title of Thesis: The composition of breast milk and basal metabolic rate in lactating women.

Breast milk is the ideal first food for infants for the first six months of their life. Healthy growth and development of infants depend on the quality and the quantity of human milk. Lactation, particularly milk composition, may be influenced by various factors such as maternal body composition, maternal energy balance, physiological events in the mother, genetic factors, parity, duration of pregnancy, stage of lactation, then for example socioeconomic status, maternal diet and individual needs of breast-fed infants.

In our study, we examined mothers' anthropometric parameters, anthropometric parameters of breast-fed infants, mothers' indirect calorimetry and the composition of breast milk in four different periods postpartum. The aim of our study was to determine the interactions between the various components of breast milk and other measured parameters.

In our study, we found that the weight gain in breast-fed infants, the fat mass gain (in g) and the fat free mass gain were significant (ANOVA, $P < 0,0001$). The 24-hour content of urea in urine as a parametr of indirect calorimetry increased significantly (ANOVA, $P = 0,0445$). The retinol concentration in breast milk decreased significantly (ANOVA, $P = 0,0003$). The fat concentration in human milk increased irregularly but significantly (ANOVA, $P = 0,0337$). The protein content in milk samples decreased significantly (ANOVA, $P < 0,0001$). The average concentration of myristic acid increased significantly during lactation (ANOVA, $P < 0,0001$). And the amount of dihomo-γ-linoleic acid decreased significantly (ANOVA, $P < 0,0001$).

The most important correlation with P-value $< 0,0001$ was found between the infant weight and the protein concentration ($r = -0,5261$), the myristic acid content ($r = 0,4779$) and

the dihomo-γ-linolenic acid level (r = -0,5389), between the FFM in infants and the myristic acid content (r = 0,4094) and the dihomo-γ-linolenic acid content (r = -0,4680), between the infant fat concentration (in %) and the dihomo-γ-linolenic acid content (r = -0,4472) and finally between the difference of current weight and weight before gravidity and the eicosapentaenoic acid level (r = 0,3986).

In our study, we found, that the most important components of breast milk regarding to other measured parameters were proteins, myristic acid, dihomo-γ-linolenic acid and eicosapentaenoic acid. In conclusion, the composition of breast milk correlated significantly with weight, fat content and fat free mass in the infants more than with maternal anthropometric parameters or basal metabolic rate. Further research is required to present clear conclusions.